CLARK TESTING

www.ClarkTesting.com

CLARK TESTING

TESTING FOR THE STEEL INDUSTRY

TESTING SERVICES PROVIDED BY

CLARK TESTING

- Analytical Chemistry
- Coal & Coke
- Condition Monitoring Services
- EMC/EMI, Electrical Testing
- Environmental Aging / Life Cycle
- Fuels & Lubrication
- Hydraulics & Pneumatics
- Industrial Hygiene
- NACE
- Powertrain / Gear Box
- Seismic
- Shock & Vibration
- Structural, Fatigue, Load

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Pittsburgh, PA
Corporate Offices
1801 Route 51
Jefferson Hills, PA 15025
Tel: 412.387.1001
Fax: 412.387.1027

Buchanan, MI
821 E. Front Street
Buchanan, MI 49107
Tel: 269.697.8632
Fax: 269.697.4525

Bluefield, WV
3450 Maple Acres Road
Bluefield, WV 24701
Tel: 304.325.8200
Fax: 304.325.8203

St. Louis, MO
1470 Bluffview Dr
Dupo, IL 62239
Tel: 618.248.3551

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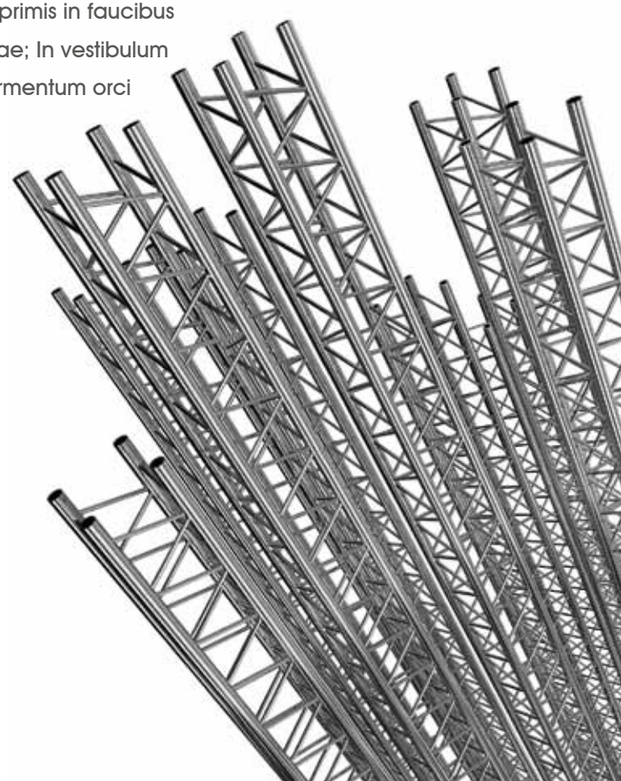

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ANALYTICAL CHEMISTRY

Clark specializes in routine analysis and comprehensive investigative chemical testing for the steel and related industries. The Analytical Chemistry Lab ensures high quality performance through analytical expertise, documented test procedures, and stringent quality assurance standards.

Clark is currently accredited under ISO/IEC Guide 17025 standards. All testing is performed in accordance with ASTM, API or other applicable methods.

Clark routinely analyzes ferrous and nonferrous metals, metallic and organic coatings, process solutions, petroleum products, and surface cleanliness of steel. Other capabilities include analysis of raw materials and by-products such as steel additives, fluxes, ceramics, refractory, slag, lime, pellets, scrap, bag house dust, coal and coke, as well as other industrial materials for composition and/or contamination.

TESTING SERVICES AVAILABLE

Routine Testing

- Alloy Analysis, OES/ICP
- Metal Fines on Sheet, ICP
- Metal Oxides, XRF/ICP
- Metallic Soaps on Sheet, ICP
- Metals, OE/XRF/ICP/AA
- Slag/Refractory/Ore/,XRF
- Surface Cleanliness
- Ion Chromatography
- C, S, O, N by Combustion
- Forms of Carbon, LECO
- Phase Identification, XRD
- Macro Etch
- Sulfur Print
- Forms of Iron
- Loss on Ignition
- Moisture Determination
- Oil Film Weight
- Steel Coating Analysis (Coating Weight & Coating Composition)
- Organis, by GC/HPLC

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NACE TESTING

National Association of Corrosion Engineers

The primary function of the NACE Lab is testing pipe to meet the API requirements for sour service pipe sold as oil country tubular goods (OCTG). We perform the testing that requires Hydrogen Sulfide exposure. We follow two methods NACE TM0177 (Tensile, Bent Beam, and DCB) and NACE TM0284 (HIC).

H2S corrosion process occurs during drilling for oil and natural gas, in the petrochemical industry, oil refineries, and even in the food processing industries. Laboratory investigation of corrosion and corrosion resistance can help you establish material selection under the prevailing conditions of use. Corrosion depends upon the environment, the type of concentration of pollutants, temperature, pressure, and dynamic activity.

NACE testing can be accomplished on steel bars, pipe, or sheet. Preparation of testing may be through a section of bar or pipe. Presently, we test materials without corrosion inhibitors such as paint or WD40, though we plan such testing in the future.

Samples are subjected to a prescribed load in a corrosive solution of salt water saturated with H2S; designed to mimic field conditions found in actual use.

Typical testing runs from five days to 30 days, based on the test selected. We can vary solution chemistry, gas concentration, or the testing time to meet your requirements. Results are reported for each group of tests and include the sample information, test conditions, and final result.

Specialty Testing

- Hydrogen-Induced Cracking Test
- NACE Double Cantilever Beam Test
- NACE 3 Point Bend Beam
- NACE 4 Point Bend Beam
- NACE Tensile

FUELS & LUBRICATION

COAL & COKE

Clark Testing Fuels & Lubricants Laboratory tests distillates, including gasoline and diesel fuels, alternative fuels (biodiesel, ethanol), oil, lubricants, and grease products for physical properties and chemical compositions relative to ASTM specification.

CAPABILITIES

Clark Testing Fuels & Lubricants Laboratory serves Steel producers, raw materials suppliers, engineering and manufacturing companies, lubricant and additive manufacturers coal and coke producers and the refining industry

- Product Evaluation
- Compatibility Assessment
- Quality Assurance
- Performance Measurement
- Certificate of Analysis
- Technical Support

CLARK TESTING

A unique attribute of this lab is the use of pilot test ovens with closely controlled testing variables that include heating rate, pulverization and bulk density, all of which simulate actual plant operating conditions. In addition, the Clark Coke & Coal lab offers customized training programs and seminars for clients.

TESTING SERVICES AVAILABLE

- Chemical and physical analysis
- Consulting and training programs
- Pilot-oven carbonization testing
- Rheological analysis
- Coal sample blending and preparation
- Petrographic analysis
- Reactivity and CSR
- Pilot ovens, which determine coking pressures, volume percent changes (shrinkage/expansion) and resultant coke quality

UNIQUE PROGRAMS

Coal Quality Verification Services (CQVS)

- Inspection and monitoring of coal and coke shipments
- Quality confirmation audits using ASTM and/or customer specifications
- ISO QMS and EMS Audits
- Shipment sample collection and analysis
- Specialized consulting and technical services
- FCA Product Application & Monitoring Service

CONDITION MONITORING SERVICES

TESTING FOR THE STEEL INDUSTRY

Clark Testing Condition Monitoring Services Laboratory (CMS Lab) provides oil analysis and diagnostics to enhance maintenance programs. Our CMS Lab assists maintenance professionals in the early detection of equipment problems, and in predicting future machine reliability. The CMS Lab provides oil and water glycol analyses to help maximize machinery performance, extend oil change intervals, and minimize oil-related disruptions in production schedules.

Filter Debris Analysis

Used filters are opened and the accumulated debris is extracted and ferrographically analyzed. Diagnosis can determine the root cause of wear.

Oil Analysis

Samples of oil are analyzed for degradation, contamination and wear debris. The diagnostics listed on our data reports provide maintenance personnel with information to help them with machine reliability.

The CMS Lab assists clients in knowing when and how equipment is degrading through testing machine oil samples. By managing the lubricants in machinery, clients lower maintenance and lubrication costs, improve maintenance scheduling, and reduce parts inventory.

The CMS Lab tests samples from frontline equipment, as well as incoming lubricants for compliance to specifications and quality assurance. A team of highly skilled technicians, state-of-the-art instrumentation.....

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TESTING SERVICES AVAILABLE

- Elemental additive depletion and wear analysis
- Wear debris diagnostics
- Service Life Evaluation
- Recycled/reclaimed oil evaluations
- Lubricant characteristics evaluation
- Lubricant degradation testing
- Quality assurance programs
- Diagnosis and maintenance recommendations

AVAILABLE TESTS

- Acid Number (former TAN)
- Infrared Organic Spectrometry (FTIR)
- pH of fluid sample
- Viscosity, Kinematic (40°C, 100°C, Visc, Index)
- Wear Debris Analysis-Optical Ferrography (WDA)
- Reserve Alkalinity
- Base Number (former TBN)
- Particle Cleanliness (ISO, SAE, or NAS Codes)
- Spectrometric Analysis (21 metals)
- Water by Karl Fischer Titration
- Wear Index-ferrous particle quantifier (WI)
- Density

TEST PACKAGES

- Rolling Mills
- Gearboxes
- Chillers
- Compressors
- Transmissions
- Hydraulics
- Conveyors
- Turbines
- Blowers
- Motor Bearings
- Pumps
- Diesel Engines
- Differentials

DDE TEST

INDUSTRIAL HYGIENE

DYNAMIC DEMULSIBILITY ENDURANCE TEST
Exclusively by Clark

Background

Clark Testing is the premiere lab for super dynamic demulsibility testing. Rapid separation of water contamination in lubricating oil is an important system characteristic. Development of lubricant technology has advanced oil blends to separate water quickly and at lower temperatures. This allows for new bearing system design such as elimination of traditional resting tanks. However, at issue is the need for a laboratory test method, which allows the oil demulsibility characteristics to be more realistically evaluated than allowed by the traditional ASTM D1401/ ISO 6614 and ASTM D 2711, which are static tests. These tests can be used as screening test because if the oil fails one of these static tests, it will fail the DDE test. The Dynamic Demulsibility Endurance Test (DDE) measures the ability of circulating oil to separate water under accelerated and simulated lubrication system circulating conditions. The test offers controlled and standardized conditions for repeatable evaluation of sample oils.

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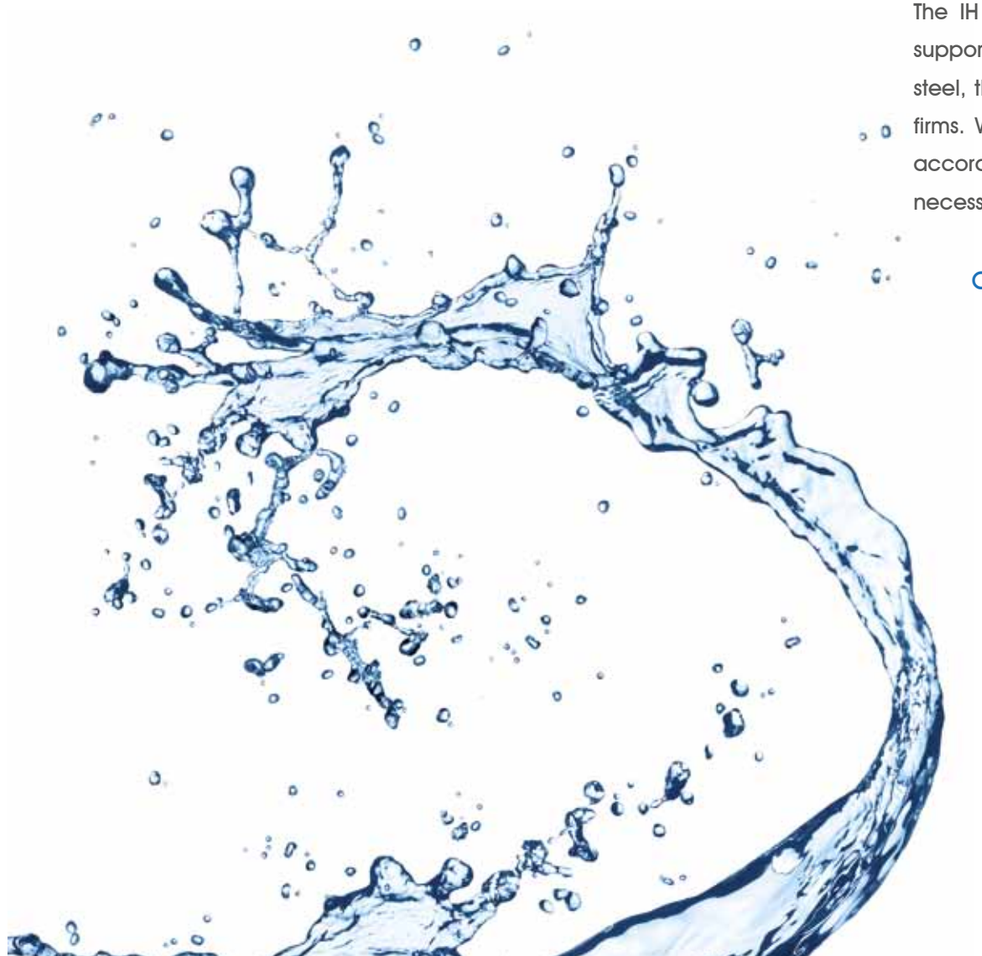

The IH Lab has been AIHA accredited since 1986. Over the years, we have supported the light and heavy manufacturing industries including aluminum and steel, the refinery and power generation industries, as well as various consulting firms. We provide analytical testing of air samples for monitoring worker safety according to OSHA and NIOSH standards. Clark also provides the media necessary to complete such sampling.

Common Testing

- Gravimetric – Total/Respirable Dust
- Extractions – Oil Mist
- Coke Oven Emissions
- Crystalline Silica
- Hexavalent Chromium
- Amions – Acid Fumes, Ozone, Fluorides
- Metal Fumes/Dust
- Organic Vapors – Various Solvents
- Alcohols
- PNA's